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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Azat M. Latypov

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EXAMINER

RASHID, DAVID

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/765,948		LATYPOV ET AL.	
	Examiner		Art Unit	
	David P. Rashid		2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-13, and 15-21 is/are rejected.
- 7) ☒ Claim(s) 4 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2/10/2005</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

All of the examiner's suggestions presented herein below have been assumed for examination purposes, unless otherwise noted.

Drawings

1. The following is a quote from 37 CFR 1.84(h):

All views of the drawing must be grouped together and arranged on the sheet(s) without wasting space, preferably in an upright position, clearly separated from one another, and must not be included in the sheets containing the specifications, claims, or abstract.

2. FIG. 1 through FIG. 3 are objected to under 37 CFR 1.84(h) for failing to group together and arrange on the sheets without wasting space – it is suggested to either group FIG. 1 and FIG. 2 together on one sheet, or FIG. 2 and FIG. 3 together on one sheet. It is also suggested to fit FIG. 6 and FIG. 7 together if possible.

3. FIG. 1 through FIG. 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (as supported as “conventional systems” in the specification). See MPEP § 608.02(g).

4. FIG. 8 is objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “808” has been used to designate both “light intensity of pixel 801” and the “portion of the pupil captured by the projection optics” – it is suggested to change the reference character “808” with the two arrows to “810”.

5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet,

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even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The following is a quote from 37 CFR 1.72:

(b) A brief abstract of the technical disclosure in the specification must commence on a separate sheet, preferably following the claims, under the heading "Abstract" or "Abstract of the Disclosure." The sheet or sheets presenting the abstract may not include other parts of the application or other material. The abstract in an application filed under 35 U.S.C. 111 may not exceed 150 words in length. The purpose of the abstract is to enable the United States Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure.

7. The abstract is objected to for the following reasons the title of the invention is contained on the abstract sheet – suggest removing the title of the invention from the abstract sheet.

8. Page 13, paragraph [0046] incorrectly incorporates by reference the application titled "System and Method For Pistoning A Micromirror Spatial Light Modulator Array Using Shearing Interferometry" (see MPEP Section 608.01(p), 37 CFR 1.57) – it is suggested to add the serial number and filing date to properly incorporate by reference.

Claim Objections

9. 37 CFR 1.75(a) reads as follows:

The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

10. **Claims 3 and 8** are objected to under 37 CFR 1.75(a) for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention.

(i) Claim 3 cites “using a charge coupled device (CCD) to perform the measuring step” where there is no measuring step within claim 3 or claim 1 from which it depends – it is suggested to change “measuring step” to “capturing step”.

(ii) Claim 8, line 2 cites “strong sensitivity” but it is unclear what is considered “strong” since there is no definite magnitude or range, as it will be assumed for examination purposes any sensitivity is considered “strong”.

(iii) Claim 8, line 2 contains a typographical error – suggest changing to “...using an apodization...”

(iv) Claim 8, line 4 cites “substantially well resolved” but it is unclear what is considered “substantially well” since there is no definite magnitude or range, as it will be assumed for examination purposes any pixel is “substantially well” resolved.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. **Claim 9** is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for those pixel movements such that a portion of a zero order lobe of a pixel diffraction pattern is blocked using an apodized pupil (one of an annular and a semi-circular pattern), does not reasonably provide enablement for those pixel movements such that no portion

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of a zero order lobe of a pixel diffraction pattern is blocked. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to enable the invention commensurate in scope with these claims. A pixel movement such as moving from a vertical pointing position to horizontal pointing position (90 degree turn) would not reflect any light into the apodized pupil such that a portion of a zero order lobe of a pixel diffraction pattern will not be blocked since there is no "blockage".

It is suggested to amend the dependent or respective independent claim such that it limits pixel movement so that a portion of a zero order lobe of a pixel diffraction pattern can be blocked.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. **Claims 1, 2, 3, 5, 6, 7, 8, 11, 12, 13, 15, 16, 19, 20, and 21** are rejected under 35

U.S.C. 102(b) as being anticipated by Sandstrom (US 6,399,261 B1).

Regarding **claim 1**, Sandstrom discloses a method (Col. 2, lines 27 - 53) comprising:

applying a voltage (Col. 5, lines 12 – 13; Col. 13, lines 30 - 35) having a voltage value (any applied voltage has a “voltage value”) to pixels (FIG. 2; FIG. 3; FIG. 4) in a spatial light modulator (SLM) (FIG. 4; Col. 2, lines 66 – 67; FIG. 6, element 601) to move the pixels (FIG. 4);

reflecting light from the moved pixels (FIG. 4);

passing the reflected light (Col. 12, lines 15 - 17) through an apodized pupil (FIG. 4, elements 402, 404; FIG. 6, elements 608, I_1 , I_2) in an optical system (FIG. 6, element 604);

capturing an image from the light after it passes through the apodized pupil (“CCD camera” in Col. 13, lines 3 - 7);

correlating the image and the voltage value to generate a result signal (“...series of test patterns...” in Col. 13, lines 27 - 31); and

calibrating the pixels using the result signal (Col. 13, lines 20 - 34).

Regarding **claim 2**, Sandstrom discloses the method of claim 1, further comprising individually resolving each of the pixels (“...for every corresponding SLM pixel...” in lines 31 - 34) using the apodized pupil (FIG. 4, elements 402, 404; FIG. 6, elements 608, I_1 , I_2).

Regarding **claim 3**, Sandstrom discloses the method of claim 1, further comprising using a charge coupled device (CCD) to perform the capturing step (“CCD camera” in Col. 13, lines 3 - 7).

Regarding **claim 5**, Sandstrom discloses the method of claim 3, wherein the image of each of the pixels is captured using more than one cell in the CCD array (It is implicit if not already inherent that the image of each of the pixels is captured using more than one cell in the

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CCD array. This can also be deduced since the prior art searched at this point does not teach wherein the image of each of the pixels is captured using one cell in the CCD array.).

Regarding **claim 6**, Sandstrom discloses the method of claim 1, further comprising:
tilting the pixel (FIG. 2; FIG. 3; FIG. 4) through a plurality of desired angles (Col. 7, lines 36 - 38); and

performing the capturing step for each of the desired angles (those angles desired from the possible “25 levels (plus zero)” to perform the calibration as outlined in Col. 13, lines 20 – 34 are performed).

Regarding **claim 7**, Sandstrom discloses the method of claim 1, further comprising:
tilting the pixel (FIG. 2; FIG. 3; FIG. 4) through a plurality a set of angles (Col. 7, lines 36 - 38); and

performing the capturing step for each angle in the set of angle (those angles in the set from the possible “25 levels (plus zero)” to perform the calibration as outlined in Col. 13, lines 20 – 34 are performed)

using interpolation to determine a voltage value that moves the pixel to an angle outside the set of angles (“interpolating” in Col. 7, lines 36 - 38).

Regarding **claim 8**, Sandstrom discloses the method of claim 1, further comprising forming the apodized pupil using an apodization pattern (the annular shape of element 608 in FIG. 6) that results in strong sensitivity of a resolved form of the image to the tilt of the pixels (the annular shape results in “strong” sensitivity of a resolved form of the image to the tilt of the pixels), while the image of each of the pixels is substantially well resolved (the image of each of the pixels is “substantially well” resolved).

Regarding **claim 11**, Sandstrom discloses the method of claim 1, further comprising using projection optics of a lithography tool ("The present invention relates to printing of patterns..." in Col. 1, lines 10 - 12) as the optical system (FIG. 6, element 604).

Regarding **claim 12**, claim 1 recites identical features as in claim 12. Thus, references/arguments equivalent to those presented above for claim 1 are equally applicable to claim 12.

Regarding **claim 13**, claim 3 recites identical features as in claim 13. Thus, references/arguments equivalent to those presented above for claim 3 are equally applicable to claim 13.

Regarding **claim 15**, claim 5 recites identical features as in claim 15. Thus, references/arguments equivalent to those presented above for claim 5 are equally applicable to claim 15.

Regarding **claim 16**, claim 8 recites identical features as in claim 16. Thus, references/arguments equivalent to those presented above for claim 8 are equally applicable to claim 16.

Regarding **claim 19**, claim 6 recites identical features as in claim 19. Thus, references/arguments equivalent to those presented above for claim 6 are equally applicable to claim 19.

Regarding **claim 20**, claim 7 recites identical features as in claim 20. Thus, references/arguments equivalent to those presented above for claim 7 are equally applicable to claim 20.

Regarding **claim 21**, claim 11 recites identical features as in claim 21. Thus, references/arguments equivalent to those presented above for claim 11 are equally applicable to claim 21.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. **Claims 9, 10, 17, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandstrom (US 6,399,261 B1) in view of Evans et al. (US 5,965,330 A).

Regarding **claim 9**, while Sandstrom discloses the method of claim 1, further comprising forming the apodized pupil using one of an annular (FIG. 6, element 608) and a semi-circular pattern, Sandstrom does not teach blocking a portion of a zero order lobe of a pixel diffraction pattern.

Evans discloses a method for fabricating annular mask lens having diffraction-reducing edges (FIG. 13) that includes blocking a portion of a zero order lobe of a diffraction pattern (FIG. 6 wherein pseudo-Gaussian profile 60 has “0% transmissivity by about 1.1 mm” (Col. 8, lines 3 – 4). The annular apodized pupil of Evans at 1.1 mm radial position gives 0% transmission, thus completely blocking a portion of a zero order lobe of a diffraction pattern.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the annular apodized pupil of Sandstrom to include blocking a portion of a zero

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order lobe of a diffraction pattern as taught by Evans on the pixel diffraction pattern of Sandstrom to produce "...a contact lens that utilizes a "soft edge" at the junction of the clear aperture and the annular mask.", Col. 6, lines 46 – 47.

Regarding **claim 10**, while Sandstrom discloses the method of claim 1, Sandstrom does not teach further comprising forming the apodized pupil using one of a semi-plane, a shearing grating, and an algorithm derived apodization pattern, such that variations are present in at least one of transmittance and phase.

Evans discloses a method for fabricating annular mask lens having diffraction-reducing edges (FIG. 13) that includes forming an apodized pupil using one of an algorithm derived apodization pattern (Col. 13, lines 33 - 56), such that variations are present in at least one of transmittance (Col. 13, lines 33 - 56) and phase.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the annular apodized pupil of Sandstrom to include forming the annular apodized pupil using an algorithm derived apodization pattern, such that variations are present in at least one of transmittance and phase as taught by Evans because "[t]he improved mask eliminates the "halo effect" associated with conventional annular masks...", Evans, Col. 2, lines 25 – 30.

Regarding **claim 17**, claim 9 recites identical features as in claim 17. Thus, references/arguments equivalent to those presented above for claim 9 are equally applicable to claim 17.

Regarding **claim 18**, claim 10 recites identical features as in claim 18. Thus, references/arguments equivalent to those presented above for claim 10 are equally applicable to claim 18.

Allowable Subject Matter

17. **Claims 4 and 14** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. Regarding **claims 4 and 14**, while the prior art teaches the method of claim 1 and system of claim 12 respectively, the prior art fails to teach wherein the image of each of the pixels is captured using one cell in the CDD array.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Rashid whose telephone number is (571) 270-1578. The examiner can normally be reached on Monday – Friday 7:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David P Rashid
Examiner
Art Unit 2624



Brian P. Werner
Supervisory Patent Examiner
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